

REMARKSI. 35 U.S.C. 112 Rejections

Claims 1 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Regarding claim 1, the Examiner states "Claim 1, line 4 recites 'a light-emitting surface disposed'. It is unclear which element of the device is related to the light-emitting surface. The surface is not an element by itself." Applicant respectfully requests that the Examiner cite an authority which supports the Examiner's position that a surface cannot be an element by itself. Applicant further notes that the construction of claim 1 is consistent with other parts of the specification which refer to a lighting device including a chip and a light-emitting surface. See, for example, page 3, first paragraph, which states "The invention also relates to a lighting device comprising at least one light-emitting diode including a chip which is capable of emitting visible light of a first wavelength, a light-emitting surface and a phosphor layer which is provided on the light-emitting surface and which is capable of converting light of the first wavelength to visible light of a second wavelength, said light-emitting surface comprising a sub-surface without the phosphor layer."

Claim 22 is canceled, rendering its rejection moot. Applicant respectfully traverses the rejection of claim 22, but has canceled claim 22 to expedite prosecution.

Applicants respectfully submit that all claims meet the requirements of 35 U.S.C. 112.

II. 35 U.S.C. 102 Rejections

Claims 1, 3-6, 8, 9, 11-13, 20, and 23-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Vriens, U.S. 4,822,144. Applicant respectfully traverses the rejection. The Examiner states Vriens "disclose (Fig. 8) [] a light-emitting device comprising: a light emitting diode (col. 3, lines 51-52) emitting a light of a first wavelength; a light-emitting

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surface (the surface of 10), and a phosphor layer (r.n.8, for [example] -R) which is provided on a first portion of the light emitting surface wherein a second portion of the light-emitting surface (portion covered by G and B) without the phosphor (the portion without R) is surrounded by the first portion (alternatively, the second portion is a space between R and G)." As pointed out in the office action response faxed July 21, 2005, Applicant assumes the Examiner intends to refer to Fig. 1 since Vriens contains no Fig. 8.

A. Claim element: "semiconductor light emitting diode"

In the office action response faxed July 21, 2005, Applicant noted that Vriens does not teach the claim element "semiconductor light emitting diode" in claims 1, 9, and 23:

Applicant has found no teaching in Vriens of a "semiconductor light emitting diode" as recited in claim 1. Column 1, lines 26-27 of Vriens, cited by the Examiner as teaching this element of claim 1, actually says only: "... of data display in computer systems, and in, for example, display devices in dashboards etc." Vriens' light source is described only as a "radiation source 10." See, for example, col. 3, lines 51-52 and 63-64. Applicant has found no teaching that Vriens' radiation source 10 is a semiconductor light emitting device.

In response to these arguments, the Examiner has apparently changed the citation to the section of Vriens that purports to teach a light emitting diode from col. 1 lines 26-27 to col. 3 lines 51-52. The passage at Vriens' column 3 lines 51-52 does not teach "a semiconductor light emitting diode" as recited in claims 1, 9, and 23, it teaches only "a radiation source."

In the response to arguments section of the present office action, the Examiner states "Applicant's arguments filed 07/21/2005 regarding claims 1, 9, 23 have been fully considered but they are not persuasive. Applicants argue that the prior art Vriens describes 'radiation source 10' not a light-emitting device. However, the broad term 'radiation source' includes,

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incorporates a term 'light-emitting device', since --radiation-- means --energy radiated or transmitted in the form of rays, waves, or particles--(The Heritage Dictionary, 4th Ed)."

Applicant does not dispute that Vriens' "radiation source" may be a light emitting device. However, claim 1 recites "a semiconductor light emitting diode," a structure far more specific than a "radiation source" or "light emitting device." Applicant has found no teaching in Vriens that radiation source 10 may be a semiconductor device, or a diode. Applicant reminds the Examiner that MPEP section 2131 on anticipation requires that "The identical invention must be shown in as complete detail as is contained in the ... claim." (Emphasis added.) Since Vriens discloses only the broad "radiation source," not the specific "semiconductor light emitting diode" of claims 1, 9, and 23, Vriens does not show these claims' inventions in as complete detail as set forth in the claims, thus Vriens does not anticipate claims 1, 9, and 23.

B. Claim element: "second portion is . . . surrounded by the first portion"

Claims 1 and 23 recite "the second portion [without phosphor] is substantially surrounded by the first portion [with phosphor]." Claim 9 recites "the phosphor layer is removed from, or not provided on, a portion of the light-emitting surface substantially surrounded by the phosphor layer." Applicant has found no such teaching in Vriens. Besides Figs. 1 and 2, which provide only a cross sectional view and therefore cannot show a "second portion . . . substantially surrounded by the first portion," the only description Applicant has found in Vriens of the arrangement of phosphors is at col. 3, lines 46-55, which state:

Furthermore the device comprises a pattern 8 of luminescent materials which are provided in accordance with a given arrangement and which radiate in this embodiment red, green and blue light if they are irradiated by, for example UV light 9 from a radiation source 10. The red, green and blue phosphor dots coincide with the switching points defined by the electrodes 5 and 6, while the liquid crystal 2 serves as a light switch for the light generated in the phosphors.

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The above passage refers only to phosphor dots coinciding with switching points defined by the electrodes 5 and 6, the above passage does not teach that "the second portion [without phosphor] is substantially surrounded by the first portion [with phosphor]" as recited in claims 1 and 23, or that "the phosphor layer is removed from, or not provided on, a portion of the light-emitting surface substantially surrounded by the phosphor layer" as recited in claim 9. **For this additional reason, Vriens does not anticipate claims 1, 9, and 23.**

C. Dependent claims

Claims 3-6, 8, 11-13, 20, and 24-27 depend from claims 1, 9, or 23 and are therefore allowable over Vriens for at least the same reason as claims 1, 9, and 23.

In addition, regarding claims 6 and 26, claim 6 recites "wherein the second portion without the phosphor layer is at least partly covered with a light-transmitting layer which is capable of spreading light incident on said second portion." In rejecting this claim, the Examiner cites layer 13 of Vriens. However, layer 13 cannot serve as the at least partial cover of the second portion in claim 6 because layer 13 is located in a different place than the portion of Vriens the Examiner cites as the "second portion" in claim 1. **Claims 6 and 26 are therefore allowable over Vriens for this additional reason.**

Regarding claim 8, claim 8 recites "wherein the lighting device further comprises optical elements for mixing the emitted light of the first and the second wavelength." In rejecting this claim, the Examiner cites layer 14 of Vriens, which is described at column 3 line 60 to column 4 line 2 as follows:

According to the invention an interference filter 14 which substantially completely passes the UV light 9 and substantially completely reflects light generated in the phosphors is arranged between the radiation source 10 and the phosphor pattern 8. Thereby, light generated in the phosphor layer 8 which would otherwise leave the phosphor layer 8 on the side of the filter 14 is reflected by this filter 14 and thus contributes to the total light output. In this

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way a greater brightness (2 to 3 times) is obtained than if the interference filter 14 were not provided.

Nowhere does the above passage teach mixing the emitted light of the first and second wavelength; in fact, the above passage teaches that Vriens filter provides just the opposite function, it prevents the light emitted by the phosphor from mixing with light from the radiation source. **Claim 8 is therefore allowable over Vriens for this additional reason.**

III. 35 U.S.C. 103 Rejections

Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vriens in view of Duggal et al., U.S. Patent 6,294,800. Claims 2 and 8 depend from claim 1. Duggal et al. and Nakamura et al. are cited as teaching claim elements that are unrelated to the deficiencies of Vriens with respect to claim 1. Claims 2 and 8 are thus allowable over the combination cited for at least the same reasons that claim 1 is allowable over Vriens. In addition, claim 2 recites "wherein the sizes of the first portion and the second portion are such that mixing the emitted light of the first and the second wavelength results in substantially white light." As described above in reference to claim 8, Vriens teaches that mixing of the light converted by the phosphor and any unconverted light from the radiation source is to be avoided, thus there can be no motivation to combine a reference with Vriens to make white light. In fact, the only "motivation" provided by the Examiner is not a motivation at all, it is simply a circular restatement of the language of claim 2. Specifically, the Examiner states:

Vrics [sic] discloses all of the limitations except for producing white light. Duggal et al (US 6,294,800) disclose (col. 2, lines 13-29) that converting the LED radiation energy with some phosphor compositions produces substantially white light.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Johnson son [sic] et al with the phosphor compositions, as taught by Duggal et al, to achieve substantially white light.

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Applicant is unsure what the Examiner means by "Johnson son et al" and respectfully requests that the Examiner clarify which references are included in the rejection, and which references supply which elements of the rejected claims. Even assuming that "Johnson son et al" is a typographical error and the Examiner intended to write "Vriens" instead of "Johnson son et al," the Examiner still has not provided a motivation, since the above-quoted rejection simply states that Duggal et al. recites merely the possibility of making white light, not a motivation for modifying Vriens to do so. Claim 2 is therefore allowable over Vriens and Duggal et al. for this additional reason.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vriens in view of Nakamura et al. Claim 10 depends from claim 9. Nakamura et al. is cited as teaching claim elements that are unrelated to the deficiencies of Vriens with respect to claim 9. Claim 10 is thus allowable over the combination cited for at least the same reasons that claim 9 is allowable over Vriens.

Applicant thanks the Examiner for allowing claims 14, 16, 17, and 21.

Applicant respectfully requests allowance of all pending claims. Should the Examiner have any questions, the Examiner is invited to call the undersigned at (408) 382-0480.

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